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NON-GONOCOCCAL URETHRITIS*

By A. H. HARKNESS, M.R.C.S., L.R.C.P.

MR. CHAIRMAN, LADIES AND GENTLEMEN,—During the final stages of treatment of a case which was originally one of acute gonorrhœa, there is often a residual urethritis where no organisms or only non-specific organisms are found. This is seen frequently, and is undoubtedly the most prevalent form of non-gonococcal urethritis. In this type of case it is possible that gonococci may be hiding in the deep tissues, and repeated bacteriological examinations must be made during the subsequent course of treatment. These are simply cases of gleet where no gonococci are found.

Again, there is a post-gonococcal urethritis which is seen in patients who have recently suffered from gonorrhœa and who have been wrongly discharged as cured. After sexual intercourse or a drinking bout, a non-gonococcal discharge quickly appears, and if the case is thoroughly investigated, the cause of the recurrent urethritis will be found. So much for this aspect of the subject.

If we now consider the primary inflammatory manifestations of the urethra, not due to the gonococcus and not following a gonococcal infection, we find many and varied causes. Certain articles of diet, such as cress, asparagus, or strawberries, can provoke a urethritis. I have seen a case of urethritis which always came on after eating asparagus. It can also occur after taking certain drugs such as cantharides, turpentine, etc., which act on the mucous membrane of the urethra. It has been observed during the course of certain systemic diseases, and is quite often a local manifestation of a descending infection from more serious lesions of the upper urinary tract. It is often due to trauma, but the most frequent and the most important causes are those of venereal origin. There is a primary infection with non-specific organisms, an aseptic urethritis, a urethritis due to the three stages of syphilis, to soft sores, and a parasitic

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urethral discharge associated with the presence of protozoa, metazoa and fungi. A urethritis is also seen in climatic bubo when the primary lesion is intra-urethral. There are also conditions which simulate a urethritis. *Primary infections with non-specific organisms* occur in cases with or without a previous history of gonorrhœa. They are usually contracted from a woman who has some cervical lesion and who is suffering from leucorrhœa ; or by rectal coitus. Romanis and Mitchiner mention a case of severe bacillus coli urethritis in a medical student. After taking his rectal temperature he introduced the dirty thermometer into his urethra in order to compare the temperature of the urethra and rectum.

Most of the known organisms have been described as causing the condition, but the commonest, in my experience, are staphylococci, diptheroids, micrococci, streptococci and diplo bacilli. The urethritis may be caused by one of these organisms, or it may be the result of a mixed infection. The incubation period is longer than it is in gonorrhœa and the discharge is not so profuse. The signs and symptoms are often very similar to acute gonorrhœa, and it is only by examining a smear of the urethral discharge that the true nature of the infection can be determined. If the cases are seen early when the infection is only anterior, they are not difficult to cure, but if the infection has spread to the posterior urethra it sometimes takes months before the patient can be given a clear bill of health. Player considers that a clinically symptomless prostatitis is often the cause of the delay. The urethra-scopic picture of the anterior urethra is the same as it is in gonorrhœa. Some workers consider that the gonococcus is always lurking in the background even in primary infections with non-specific organisms, but in all my cases I have never found gonococci during the subsequent course of the urethritis, even after repeated bacteriological examinations. These infections can definitely be passed from one person to another. I have examined a man and found him to be suffering from a primary infection with non-specific organisms and have also found the identical organisms in the cervical discharge of the woman from whom he contracted the disease. At the present time I have two men attending my out-patients at St. Peter's Hospital with a primary staphylococcal urethritis contracted from the same woman.

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The following is a typical case. A man, aged 38, with no previous history of venereal disease, consulted me for a urethral discharge which was first noticed ten days after coitus. There was a fairly profuse urethral discharge, a smear showing diphtheroids, both intra- and extra-cellular in position, and cultures yielded a pure growth of diphtheroids. The urine was hazy with threads in the first glass, and the second and third glasses were clear. The woman who infected this man was examined by a gynaecologist, who found a cervical infection due to diphtheroid bacilli. Anterior and posterior irrigations were given night and morning with oxycyanide of mercury 1/6,000, and in three weeks the urine was clear with no threads, and after carrying out the usual tests for cure, the patient was discharged.

It is considered by many that oxycyanide of mercury is the solution of choice in the treatment of these cases, but in my opinion, any warm and weak irrigating solution, not excluding potassium permanganate, will effect a cure.

I do not find that this type of infection is more liable to produce complications than a gonorrhœal infection treated on orthodox lines, as in my series, complications are of rare occurrence. There is a type of urethritis due to non-specific organisms which does lead to more frequent complications, and that is due to an infection which descends from the kidneys, and these infections often reach and infect the prostate and vesiculæ seminales without any signs of an infection being present in the kidneys. The most frequent complication is an epididymitis, and this, too, is more often precipitated by the strong forefinger of the surgeon than by the disease itself. Even though secondary organisms play such an important rôle in metastatic gonorrhœa, these cases seldom develop a blood infection. Kristjansen describes a case of non-gonococcal urethritis which developed polyarthritis and conjunctivitis. The complement fixation test for gonorrhœa was completely negative.

Aseptic urethritis is a condition where only pus cells and epithelial cells are found in the discharge and repeated cultures are always sterile. The causes are over-indulgence in alcohol, exercise, or sexual intercourse. Luys considers that intercourse at the time of the periods is especially dangerous. Callomon considers that transmission through the female has been established. Hecht

says that the infection is due to direct transmission ; in one of his cases, it was due to intercourse, and in another, by sharing the use of a pair of trousers. Alcohol taken in excess is a marked irritant to the urogenital tract, and Whitney considers that there has been a large increase in cases of non-specific urethral discharge following the taking of alcohol since prohibition has been, theoretically, in force. He considers that the urethritis is due to the alcohol itself, and not to any impurities. In every case of his series there was a history of much drinking. In some of his cases there was no previous history of venereal disease, and there had been no venereal exposure. The incubation period was short, and he thinks that a moderate inflammation of the prostate was the source of the discharge in the majority of his cases. No complications were observed.

In cases of aseptic urethritis the discharge is slight, and there is no pain on micturition. The course of the disease does not appear to be influenced to any marked extent by the taking of alcohol or by sexual intercourse. I have seen two cases of this type where the urethritis was chronic from the beginning and urethroscopy showed a well-marked granular urethritis. These are most difficult to cure, and one must always consider the possibility of the primary cause of the urethritis being a more serious lesion of the urinary tract. Irrigations with silver nitrate 1/15,000 to 1/10,000 give the best results, and a long course of dilatations is necessary when urethroscopy shows the presence of a granular urethritis. I had under my care a mild case of aseptic urethritis due to drink and masturbation. When these excesses were discontinued, the discharge disappeared in a month without any local treatment. I have never seen a case develop complications.

Urethritis due to Trauma.—After promiscuous sexual intercourse, syringing out the urethra with strong solutions of potassium permanganate, protargol, silver nitrate or lysol is often adopted as a prophylactic measure. Within twenty-four hours there is a chemical urethritis, and a smear of the discharge will be found to contain pus cells and possibly a few extra cellular organisms. It is advisable to keep these cases under observation and they usually clear up in a few days without any local treatment. During the war, German soldiers were known to

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inject sublimate into the urethra for the purpose of provoking a urethritis which would necessitate hospital treatment. Dietl describes three cases of urethritis due to the use of contraceptives.

A urethral discharge is often seen the day after passing a large steel or bougie to dilate a stricture, but it occasionally occurs in a normal urethra after instrumentation. Over-instrumentation, too, can keep up a urethral discharge.

A good example of infection of the urethra by bacteria other than the gonococcus is seen in urethritis following the irritation of an indwelling catheter. The following notes were given to me by Dr. Cuthbert Dukes, the bacteriologist of St. Peter's Hospital. The course of such a traumatic urethritis in cases in which the urine was previously uninfected and has remained uninfected whilst the catheter was *in situ* is as follows:—For four or five days after the removal of the catheter, a few drops of pus can be expressed from the meatus and anterior urethra, but this rapidly becomes less and soon disappears without treatment. Specimens of urine passed naturally contain a large number of bacteria and several colonies are obtained from a single drop of uncentrifuged urine. The bacteria are invariably cocci. The commonest type is staphylococcus albus, and the next commonest a hæmolytic micrococcus which produces a greenish growth on hæmoglobin agar. Other types of micrococci and streptococci of the *fæcalis* group may be the infecting agents in other cases. Usually the growth is pure. There is no difference in the severity of the infections caused by these different cocci. They all clear up without treatment in a few days, and the urine usually becomes sterile after about a week. A very different prospect is opened up if the bacteria of the *B. coli* or *B. proteus* group are found in the urine during catheterisation or soon after the removal of a retained catheter. The appearance of these bacteria will be followed by pyuria and clinical evidence of infection of the bladder or kidneys. Such *B. coli* and *B. proteus* infections affect the entire urinary tract: they last several weeks and are very refractory to treatment. Traumatic infections of the urethra, on the other hand, are always caused by cocci: they do not extend to the bladder and kidneys, and they tend to heal spontaneously without any complications.

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Irritation arising from phosphaturia or oxaluria also causes a urethritis.

Urethritis due to a meatal chancre is a serious lesion to overlook. It is essential in examining all cases of urethritis to palpate the end of the urethra for any signs of induration, and in doubtful cases a dark ground examination should be carried out. There is usually a clear urethral discharge containing small filaments of pus.

At present I have a case attending my out-patients at St. Peter's Hospital who, having attended his doctor for so-called gonorrhœa for one month, sought further advice as the discharge still persisted. The first glass of urine was muddy, and the second glass clear. There was a meatal chancre, scrapings from which contained *spirochæta pallida*. Irrigations were stopped, and after the second injection of 914, the urine was clear with no threads.

This case emphasises the importance of a microscopic examination. If a smear had been made in the first place, the result would have shown that it was a case of non-gonococcal urethritis, and that a more thorough examination was necessary. Janet rightly considers that a doctor who treats a case of gonorrhœa without resort to a microscope is like a deaf man undertaking the treatment of pleurisy or a blind man venturing into ophthalmology.

Intra-urethral herpes causes a urethritis. Lewin states that it always appears in the form of recurrent attacks of a watery discharge from the urethra. There is no pain, and the discharge disappears after eight to fifteen days with no local treatment. There is usually herpes elsewhere on the genitalia and urethroscopy shows vesicles or small superficial ulcers. Occasionally the inguinal glands are enlarged and tender. Klausner describes a case of severe stricture following repeated attacks.

I have seen cases of *intra-urethral soft sores* produce a urethritis, but the diagnosis was not difficult as there were other lesions on the genitalia. I have seen the ulcers perforate the urethra and produce a temporary urinary fistula. Pain on micturition was always a marked symptom.

Stricture of the urethra is often the cause of a persistent urethritis, and in a case of non-gonococcal urethritis it is a serious lesion to overlook. In the routine investiga-

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tion of a patient it is an easy matter to diagnose this condition. Where there is a previous history of gonorrhœa, one should always be on the look-out for it. On one occasion I saw a case of non-gonococcal urethritis where a subsequent examination revealed the fact that the primary cause was a traumatic urethral stricture.

Descending Infections from the Upper Urinary Tract.—When any case of posterior urethritis where the urine is muddy in both glasses does not react to treatment, and when the routine investigation of the urethra, prostate, vesiculæ seminales and Cowper's glands does not show a sufficient cause for the pyuria, a thorough investigation should be made of the upper urinary tract, as more serious lesions may be the cause of the urethritis. A non-specific urethritis may be the patient's only symptom. A smear of the urethral discharge will, in these cases, be found to contain pus cells and non-specific organisms, but sometimes no organisms will be found. The urine will be muddy in all glasses. The investigations suggested are: urine examination for tubercle bacilli, X-ray, cystoscopy and pyelography. The usual lesions found are: pyonephrosis, pyelitis, calculus anywhere in the urinary tract providing there is an infected urine, tuberculosis, senile enlargement of the prostate, and diverticulum of the bladder.

In senile enlargement of the prostate there is, occasionally, either a mucoid urethral discharge which does not contain pus cells or organisms, and the urine is clear, or a muco-purulent discharge which contains pus cells and non-specific organisms.

I have seen seven cases of urethritis where the subsequent examinations proved that urinary tuberculosis was the primary cause. On one occasion, I saw tubercles with the anterior urethroscope. It was in the case of a man who was suffering from tuberculous prostatitis and vesiculitis. In all the cases that I have seen there was frequency of micturition of several weeks' duration before the appearance of the discharge.

A male, aged 46, attended my venereal out-patients at St. Peter's Hospital with a urethral discharge and pain and frequency of micturition of several weeks' duration. A smear showed large numbers of pus cells and a few Gram-positive cocci. Cultures yielded a few isolated colonies of diphtheroids and micrococci. Stained films of the centri-

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fuged deposit of the urine contained acid-fast bacilli, and cultures prepared for tubercle bacilli were positive after six weeks' incubation. On further investigation, the patient was found to have tuberculous disease of one kidney.

The following is a case in which the subsequent pathological examination showed old tuberculous disease of one kidney with a secondary infection due to staphylococcus albus. A man, aged 28, with a urethritis and pyuria, had been treated for over two years by irrigations, massage of the prostate and instrumentation. On seeking further advice, he was referred by his doctor to a colleague of

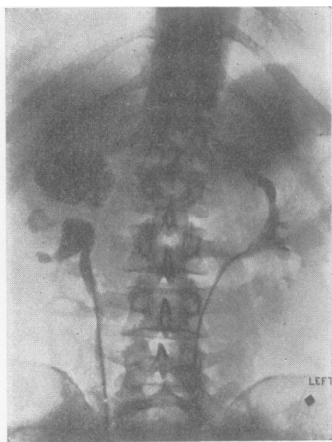


PLATE I.



PLATE II.

mine, J. A. Andrews, who, on examination, found the left kidney normal and the right showing two calcifications in the upper pole, and the middle calyx was the seat of an abscess (*vide* Plate I.).

A week ago at St. Peter's Hospital I saw a man, aged 34, with a urethral discharge and a double epididymitis. The previous history showed that he had first noticed a slight urethral discharge two months ago, and on the following day there was tenderness and swelling of the right epididymis. Fourteen days later he developed a left epididymitis. He had had no local treatment. On examination a smear of the urethral discharge showed pus cells, but no organisms. A small quantity of pus was present in the urine and cultures were sterile on solid media. Cultures for tubercle bacilli are being prepared.

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There is a small abscess on the outer side of the right epididymis and acid-fast bacilli were found in the pus aspirated. On rectal examination the prostate was normal, but there was marked dilatation of both vesiculæ seminales. The patient has been admitted for surgical treatment.

I have seen one case of urethritis where the primary infection was found to be bilharzia. It was in a man, aged 26, who consulted me with a urethral discharge which was noticed twenty-four hours before. It is possible that he was exposed to infection fourteen days previously. He complained of itching of the penis and gave a history of pains in the back and frequency of micturition of two months' duration. There was a greyish-white viscid discharge, a smear showing a fair number of pus cells, but no organisms. On examination of the urine I found bilharzia ova. This was confirmed by Dr. Christopherson. The urethral discharge lasted two days and disappeared without any local treatment. The patient was cured with intravenous injections of sodium antimony tartrate.

I have had ten cases of urethritis due to prostatic calculi and shall give brief descriptions of three. In one, the diagnosis was made by digital examination, and in the others by X-ray. Two were passed to the surgeon and prostatectomy was performed, and in the other, posterior irrigations with massage effected a cure.

Case 1.—A man, aged 55, was passed to me for treatment for a chronic staphylococcal prostatitis. His previous history showed that he suffered from gonorrhœa thirty-three years ago, and had had treatment for a urethral discharge for the last four years. On examination there was a slight urethral discharge, a smear showing pus cells and Gram-positive cocci. Cultures grew staphylococci. The urine was hazy with threads in both glasses. The prostate was definitely enlarged. Anterior urethroscopy was negative. There was pain and frequency of micturition. I gave the patient two wash-outs, with the result that the pain and frequency became more marked, and as he had already had a long course of irrigations with massage of the prostate, I omitted all local treatment and investigated him further. X-ray examination revealed prostatic calculi (*vide* Plate II.). There were 5 oz. of residual urine. In view of the

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symptoms, a prostatectomy was performed and the patient was completely cured.

Case 2.—A man, aged 46, attended my out-patients with a urethral discharge and frequency of micturition. He had been under his doctor and had syringed twice a day for twelve months. He gave a history of gonorrhœa which he had contracted twenty years ago. A smear showed a large number of pus cells and Gram-positive cocci. The urine was hazy in both glasses and cultures of the urine grew streptococcus *fæcalis*. There were 7 oz. of residual urine. Anterior urethroscopy was negative. Rectal examination revealed a stony hard bilobed



PLATE III.

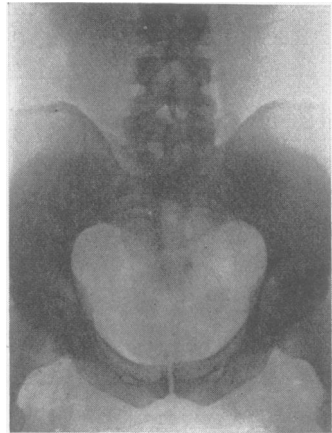


PLATE IV.

prostate. Crepitus was felt. X-ray confirmed the diagnosis of prostatic calculi, and after prostatectomy, the patient was cured (*vide* Plate III.).

Case 3.—A man, aged 39, with a previous history of gonorrhœa, consulted me for a urethral discharge. A smear showed pus cells and a few extra cellular Gram-positive cocci. Anterior urethroscopy was negative, and rectal examination revealed a firm prostate with the left lobe more prominent and firmer than the right. X-ray showed small prostatic calculi (*vide* Plate IV.). After a three weeks' course of irrigations, the urine was clear, with no threads. There are now no urinary symptoms, and there has never been any residual urine. No further treatment was considered necessary.

The next case I shall describe was passed to me for

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treatment for an acute attack of gonorrhœa and was subsequently also found to have a large vesical calculus. This man, aged 42, attended St. Peter's Hospital with a profuse urethral discharge of one week's duration. He experienced no pain or frequency and had no previous history of venereal disease. A smear showed gonococci in large numbers and the urine was muddy in all glasses. Posterior irrigations were prescribed. When last seen by me a month after the first visit, the urine was still hazy in both glasses, and he complained of terminal dribbling. A rectal examination revealed a large hard swelling in the region of the prostate. I omitted local

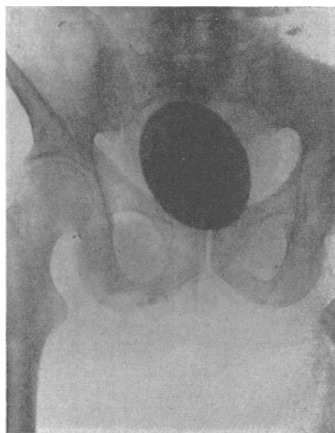


PLATE V.

treatment and advised the patient to rest in bed for a week. At the end of a week's rest the patient was persuaded by a friend to consult a urologist privately. Many months later he attended me again, and it was then that I obtained the following history. He attended this surgeon for four months for prostatic massage three times a week and was eventually X-rayed (*vide* Plate V.). A large vesical calculus weighing nearly $\frac{3}{4}$ lb. was removed by open operation. A stone of those dimensions could have been diagnosed by a bimanual prostatic examination without the aid of X-rays.

Urethritis observed during the Course of Systemic Diseases.—The urine in gout is highly acid, and a urethritis with a purulent non-gonococcal discharge is described. It is said to occur spontaneously or after a

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pure connection. A balanitis is often seen, but a urethritis in a case of gout is usually an exacerbation of a chronic gleet. On many occasions after a careless examination, these cases are described as having a urethritis. If there is a phimosis and a preputial discharge, the condition may be due entirely to a simple balanitis, or there may be a more serious lesion under the prepuce, and, if it is impossible to make a definite diagnosis, a dorsal incision should be carried out and the parts thoroughly exposed. A slight aseptic urethritis has been described at the onset of measles. Urethritis is also described in cases of malaria, mumps, staphylococcal septicæmia, influenza, Malta, typhus and typhoid fevers. In typhoid fever, Maresch and Chiari state that there is a whitish urethral discharge occurring in the third week, a smear showing pus cells and intra-cellular bacilli, and on cultivation the organisms are identical with typhoid bacilli. There is occasionally a penetration necrosis, and it can go on to gangrene. In one case there was thrombosis of the right corpus cavernosum. At St. Peter's Hospital, during the recent influenza epidemic, several cases of prostatitis due to non-specific organisms were observed in patients convalescent from this disease. One developed acute prostatitis with retention of urine, and another with sub-acute prostatitis developed an insidious urethral discharge. There was no exposure to account for the urethritis. In each case there was a urinary infection, one with the staphylococcus albus, and the other with the *Bacillus coli*. Resolution without suppuration occurred in each case. In these cases the prostate is infected, either directly from the blood stream or by organisms which are secreted by the kidneys.

Bugbee reported five cases who developed prostatic abscess after an attack of influenza, and in the pus from one the influenza bacillus was said to have been found. Briggs considers that 20 per cent. of all cases of prostatitis are non-venereal in origin, and that the most constant local symptoms are a urethral discharge and an aching in the groins and perineum.

von Lackum, of the Mayo Clinic, considers that non-venereal infections constituted about 24 per cent. of all genital infections, emphasising the importance of focal infection as an ætiological factor.

I have seen in two cases a prostatitis with a urethral

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discharge develop, following boils in remote parts of the body.

Early this year a patient, aged 21, who was suffering from a boil on the right thigh, attended St. Peter's Hospital with a slight urethral discharge, pains in the perineum and great difficulty in micturition. There was no possibility of venereal infection and no history of influenza. A smear of the urethral discharge showed a few pus cells and Gram-positive cocci. The urine was turbid, and cultures grew staphylococcus albus. The prostate was enlarged and tender, with fluctuation in the left lobe. The patient was admitted and the abscess drained, and cultures of the pus yielded a profuse growth of staphylococcus albus. I have seen a case of mumps with an orchitis and a urethral discharge.

Spence describes an interesting case of a middle-aged man who had a non-gonococcal discharge. His son was home from school suffering from a mild attack of mumps. A week later the father's temperature rose to 101, and there was slight pain in the left parotid gland. Three days later there was a left orchitis and a week later the urethral discharge had ceased. Diabetes is quite often diagnosed in the venereal department. Patients with a balanitis and less often with an accompanying urethral discharge, who have run the risk of infection, will seek advice at a clinic. It is always a wise plan to test the urine for sugar when there is redness of the preputial opening, a tip given to me some years ago by Barrington of St. Peter's Hospital, and it is surprising how frequently it is effective.

Castellani describes cases of non-gonococcal urethritis due to many varieties of *protozoa and fungi*. On one occasion, in a case of a primary urethritis in a male due to non-specific organisms, I saw several trichomonas on examining an unstained smear of the urethral discharge. It is a wise plan to examine a fresh wet specimen in all cases of non-gonococcal urethritis.

Many cases of leucorrhœa in women have definitely been found to be associated with or caused by the trichomonas flagellate. Dastidar reported four cases of urethritis in the male where trichomonas were found, and when the protozoan was not present in the urine the urethritis was cured. Capek describes two cases of trichomonas urethritis in the male, but in each case there

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was also a heavy infection with non-specific organisms. In one of his cases, trichomonas were also found in the vagina and the urethra of the patient's wife.

Urethrorrhœa, *Spermatorrhœa* and *Prostatorrhœa* may simulate a urethritis. Sexual excitement without gratification normally leads to a perfectly clear sticky urethral discharge, and this will often be mistaken for a urethritis if it is not examined microscopically. A smear will show only mucous and epithelial cells.

Spermatorrhœa is the discharge, without erection or desire, of seminal fluid containing spermatozoa. It can appear at any time, but is more often seen after defæcation or at the end of micturition. A urethral smear of the slightly opalescent discharge will show spermatozoa and the urine passed will often contain sago-like bodies which dissolve readily in acetic acid.

I recently had a patient who complained of a slight stickiness at the meatus which was first noticed ten days after coitus. A smear showed spermatozoa, but no pus cells or organisms were seen. A rectal examination revealed distended vesiculæ seminales. These were stripped of their contents and there was no discharge when I saw the patient a week later.

Prostatorrhœa consists in the escape of prostatic fluid during defæcation or at the end of micturition. I have only seen it in patients who have, or have had, chronic prostatitis, whereas urethrorrhœa and spermatorrhœa are more often seen in patients with no previous history of venereal disease.